

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A method for monitoring the health of a system, which comprises performing at each of a plurality of times the steps of:
constructing a condition signature from a plurality of condition indicators including (a) a plurality of vibration measurements acquired from said system or (b) one or more vibration measurements and one or more performance parameter measurements acquired from said system;
predicting a normal signature from a model defining one or more inter-dependencies between said condition indicators, said normal signature corresponding to a condition signature for a healthy system;
comparing said condition signature with said normal signature; and
registering an event if said condition signature differs from said normal signature by more than a predetermined threshold.
2. (Original) A method according to claim 1, wherein said model is a learnt model.
3. (Original) A method according to claim 1, wherein said model comprises a matrix with one or more non-zero off-diagonal terms to define said interdependencies.
4. (Original) A method according to claim 3, wherein the step of comparing said condition signature with said normal signature involves calculating a value for the normalised innovations squared.
5. (Original) A method according to claim 1, wherein said model comprises a neural network.
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6. (Original) A method according to claim 5, wherein the step of comparing said condition signature with said normal signature involves calculating a prediction error.

7. (Original) A method according to claim 1, wherein said times define successive intervals of at most 1 sec duration.

8. (Original) A method for monitoring the health of a system, which comprises performing at each of a plurality of times defining successive intervals of at most 1 sec duration the steps of:

constructing a condition signature from a plurality of condition indicators including (a) a plurality of vibration measurements acquired from the system or (b) one or more vibration measurements and one or more performance parameter measurements acquired from said system;

predicting a normal signature corresponding to a condition signature for a healthy system;

comparing said condition signature with said normal signature; and
registering an event if said condition signature differs from said normal signature by more than a predetermined threshold.

9. (Original) A method according to claim 8, wherein said normal signature is predicted from a model defining one or more inter-dependencies between said condition indicators

10. (Original) A method according to claim 9, wherein said model is a learnt model.

11. (Original) A method according to claim 9, wherein said model comprises a matrix with one or more non-zero off-diagonal terms to define said interdependencies.

12. (Original) A method according to claim 11, wherein the step of comparing said condition signature with said normal signature involves calculating a value for the normalised innovations squared.

13. (Original) A method according to claim 9, wherein said model comprises a neural network.

14. (Original) A method according to claim 13, wherein the step of comparing said condition signature with said normal signature involves calculating a prediction error.

15. (Previously Amended) A method according to claim 1, wherein said measurements are synchronously acquired from said system to a synchronisation imprecision of at most 1 sec.

16. (Previously Amended) A method according to claim 1, wherein said system comprises a gas turbine engine.

17. (Original) A data processing system for monitoring the health of a system, comprising:

data acquisition means for acquiring a plurality of condition indicators from said system at each of a plurality of times, said condition indicators including (a) a plurality of vibration measurements or (b) one or more vibration measurements and one or more performance parameter measurements;

processor means for constructing a condition signature from said condition indicators and for predicting a normal signature corresponding to a condition signature for a healthy system, said normal signature being predicted by a model which defines one or more inter-dependencies between said condition indicators;

comparator means for comparing said condition signature with said normal signature; and

registration means for registering an event if said comparator indicates that said condition signature differs from said normal signature by more than a predetermined threshold.

18. (Original) A data processing system for monitoring the health of a system, comprising:

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and*
data acquisition means for acquiring a plurality of condition indicators from said system at each of a plurality of times defining successive intervals of at most 1 sec duration, said condition indicators including (a) a plurality of vibration measurements or (b) one or more vibration measurements and one or more performance parameter measurements;

processor means for constructing a condition signature from said condition indicators and for predicting a normal signature corresponding to a condition signature for a healthy system;

comparator means for comparing said condition signature with said normal signature; and

registration means for registering an event if said comparator indicates that said condition signature differs from said normal signature by more than a predetermined threshold.

19.-21. (Cancelled)
